

University-Class Explorer Preproposal Conference

TMCO Overview

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TMCO Overview

Technical, Management, Cost (TMC) and Other Factors (O)

- 3 Evaluation Criteria:
 - Feasibility of the proposed approach for mission implementation, including the cost risk (TMC part of TMCO)
 - Plan for education, outreach, new technology, & SDBs (O part of TMCO)
 - Participation of Historically Black Colleges and Universities and Other Minority Universities (HBCUs/OMUs) (O part of TMCO)

TMCO Review Panels

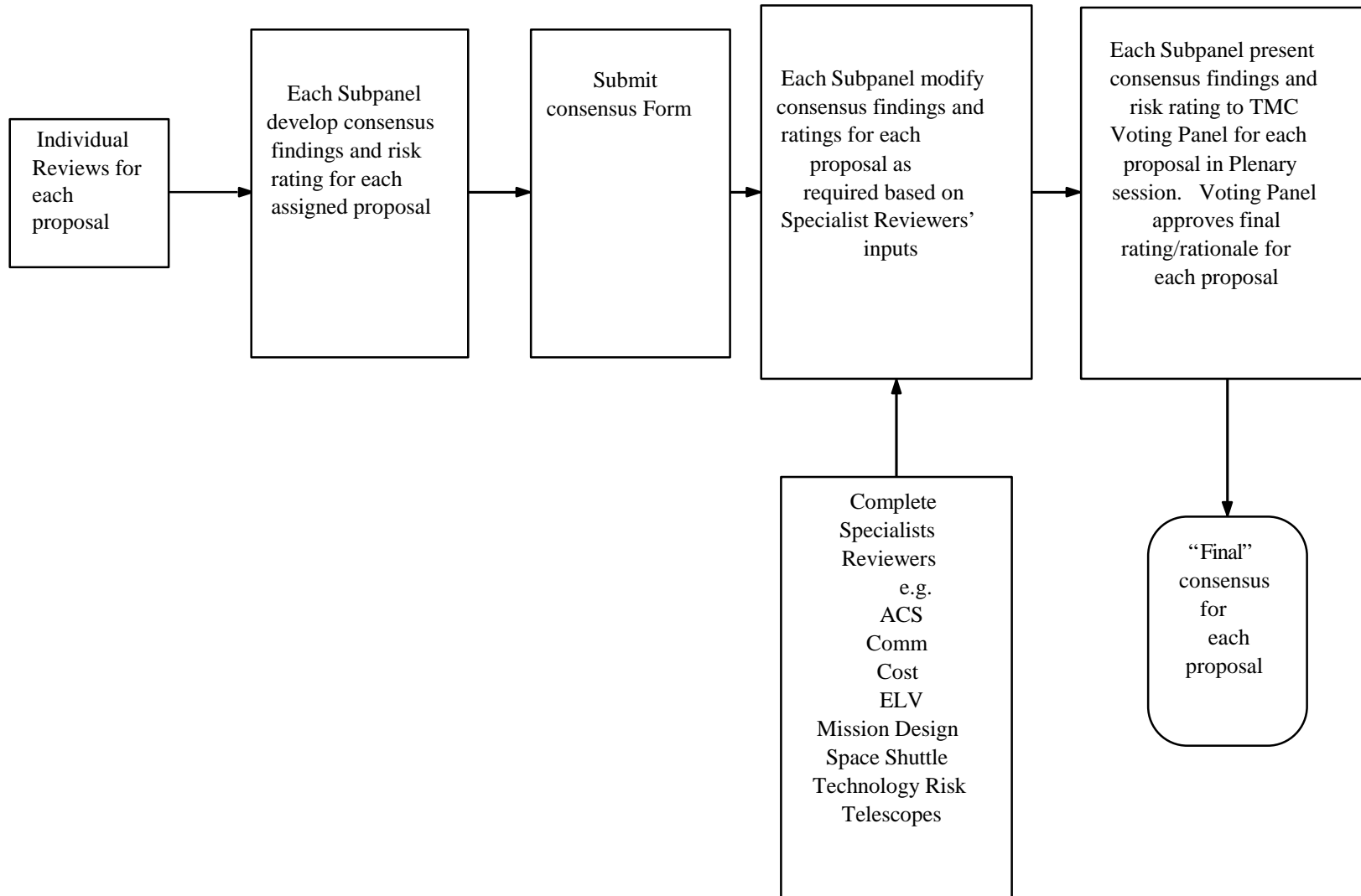
- Experts in spacecraft & balloon design, development and operations; management; cost; launch vehicles; technology development;
- Peers in education, public outreach, technology transfer and SDBs
- Peers in HBCUs/ OMUs and institutional infrastructure development

TMCO Review Objective, Process, Methodology, and Considerations

- Following charts explain

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TMC Panel Flow



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TMC Evaluation Objective

The TMC evaluation is to determine, for each proposal, the level of risk of accomplishing the scientific objectives of the mission, as proposed, on time and within cost.

3 levels of risk are typically defined: **Low Risk, Medium Risk and High Risk**

High Risk may be defined as: “Even if this is the best science, we recommend that you not pick it. It is very unlikely to be successful, as proposed.”

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Typical TMC Evaluation Questions

Will overall mission design (spacecraft, balloon, launch vehicle, ground system, mission ops) allow successful implementation of mission as proposed? If not, are there sufficient resources (time & \$) to correct identified problems?

Does proposed spacecraft/balloon design/development allow investigation to have a reasonable probability of accomplishing its objectives? Does it depend on new technology that has not yet been demonstrated? Are spacecraft/balloon requirements within existing capabilities or are advances required? Does proposal accommodate sufficient resiliency in appropriate resources (e.g., mass, power) to accommodate development uncertainties?

Will proposed management plan (e.g., institutions (as known), organization, roles and responsibilities, experience, decision making) allow successful completion of investigation? Is the PI in charge?

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Typical TMC Evaluation Questions (con'd)

Does proposer understand their risks and are there adequate fallback plans to mitigate them, including risk of using new technology, to assure that investigation can be completed as proposed?

Is the schedule doable? Does it reveal an understanding of work to be done and time it takes to do it? Is there a reasonable probability of launching on time? Does it include schedule margin?

Are proposed costs within appropriate caps and does cost estimate cover all costs including full-cost accounting for NASA Centers? Are costs phased reasonably? Does the investigation, as proposed, have a reasonable chance of being accomplished within proposed cost? Is there evidence in the proposal to give confidence in the proposed cost? Does the proposer recognize the additional costs (e.g., safety) of utilizing the Space Shuttle/Space Station?

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TMC Considerations

Mission Design

Depth of Detail
Launch Vehicle

Difficulty/Complexity/Flexibility

Spacecraft/Balloon

Depth of Detail
Simplicity vs Complexity
New Technology
Design Life/Reliability

Margins
Heritage/Maturity
Redundancy

Instruments

Requirements/Interface
Complexity/Difficulty
Depth of Detail

Heritage/Maturity
Operations

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TMC Considerations (con'd)

Mission Ops/GDS/Communication

Facilities (including ground stations)
Complexity
Depth of Detail

Comm margins
Team Experience/Roles

Systems Engineering

Depth of Detail
Complexity
QA

Trades
Integration and Testing

Management/Organization/Structure

Structure tied to Task/Teaming
Detailed description (incl SOW)
Maturity

PI/PM Roles proper
Org/key person Experience
Evidence of Commitment

Risk Management

Risk Assessment (& understanding) Technology Risk Mitigation
Reserves and Margins Descope Plan

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TMC Considerations (con'd)

Cost and Schedule

Cost Envelope (Comparison to Government Estimate)

Cost Reserves

Cost vs. Tasks

Risk Mitigation Level

Cost Basis Grassroots/Model/Actuals
 Variety of Techniques

Cost Caps - Caps vs. 20%

Technical Maturity vs. Cost Estimate

Technical Complexity vs. Cost Estimate

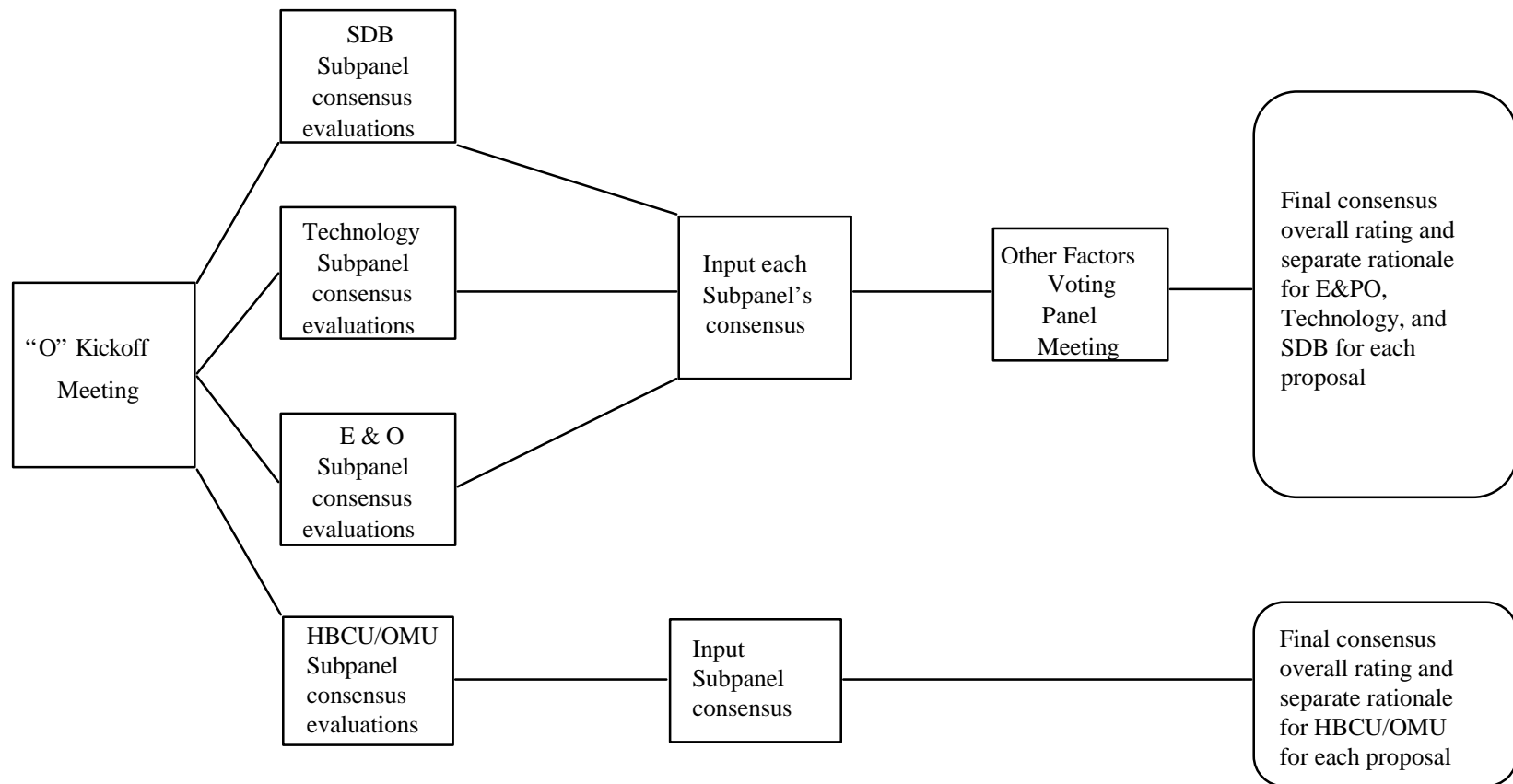
Past Experience

Schedule vs. Tasks

Schedule Reserve

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Other Factors Panel Flow



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Other Factors Considerations

Generally, the degree to which proposals address the following factors directly relate to a grade of EXCELLENT, GOOD, or POOR

Education and Outreach (Commitment, not originality, is now the key factor)

- See Appendix C in AO

- Effectiveness/realism of proposed effort
- Long-term “partnership” with education/public comm institution
- Leveraging of resources beyond requested budget
- Prospects for “multiplier effect” of proposed effort
- Support of national standards and efforts
- Capability/commitment of proposer
- Realism/adequacy of proposed budget

Technology (both infusion and transfer)

- Degree of tech transfer out to NASA, commercial, & non-aerospace industries
- Involvement of good transfer orgs
- Degree of infusion

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Outreach Considerations (con'd)

Small Disadvantaged Businesses

- Commitment to meet 8% SDB goal
- Past experience in meeting goals
- Planned SDB subcontracts vs goal

HBCUs/OMUs

- Extent of HBCU/OMU involvement in mission
- Capability and expertise in proposed role
- For Capital Investments:
 - Extent of capital investments in meeting mission needs
 - Long-term benefits of capital investments to HBCU/OMU

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Final Points

- UNEX TMCO process different from previous Explorer AOs:
 - Previously, TMCO performed on all proposals prior to Categorization
 - For UNEX, full TMCO review delayed until after Categorization
 - Only proposals which are Category 1 and possibly 2 will receive full TMCO; Category 3 & 4 proposals will only have partial TMCO
 - Debriefings will be offered based on level of review
- AO Appendix B asks for information TMCO team needs for risk assessment, but some information may not be available. This, by itself, may not increase risk rating, but more information helps understand mission risk
- Secondary payloads and Missions of Opportunity do not require all sponsor information; see Appendix B for details
- E/O self-assessment was completed; changes have been made in evaluation methodology and focus